

# UNITED STATES PATENT OFFICE.

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## TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 631,355, dated August 22, 1899.

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*To all whom it may concern:*

Be it known that I, JOSEPH A. WILLIAMS, of Cleveland, Cuyahoga county, Ohio, have invented certain new and useful Improvements in Telephone-Receivers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in telephone-receivers; and it consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a side view, mostly in longitudinal section, of an instrument embodying my invention. Fig. II is a transverse section on line II II, Fig. I, looking inwardly. Fig. III is a transverse section on line III III, Fig. I, looking inwardly. Fig. IV shows one of the devices employed in concealing and protecting one of the bobbin's terminal wire ends and coupling the said end with a wire electrically connected with one of the instrument's binding-posts. Fig. V is a sectional view illustrating the connection of screws J with the bobbin-bearing disk K. Fig. VI is a sectional view of portions of disks K and m and illustrates the registering wire-receiving perforations K<sup>2</sup> and m<sup>2</sup> of the said disks. Fig. VII is a sectional view of portions of disks K and m and illustrates the function of registering perforations K<sup>3</sup> and m<sup>3</sup> of the said disks.

Referring to the drawings, A designates the hollow case of the instrument, which case is preferably made of polished ebonite or vulcanite in the usual manner.

B represents a U-shaped permanent magnet that is suitably arranged within and centrally and longitudinally of the case A and is secured at its central portion, preferably by means of a screw b, to and centrally of the binding-post bearing-head C of the instrument's case.

G designates a double bobbin that is arranged within the case's end that bears the earpiece D and has two parallel cores G and G' arranged a suitable distance apart and wound, respectively, with suitably-insulated wire G<sup>2</sup> in the usual manner. The cores of

the bobbin are composed, respectively, of suitable magnetic material—such, for instance, as soft iron—and extend inwardly a suitable distance beyond the inner end of the bobbin between the opposing inner surfaces of the free ends of the permanent magnet, that is cut away upon the opposing sides of the said ends, as at B', to accommodate the location of the two cores that engage the different magnet ends, respectively. Insulating material i is interposed between the inner ends of the cores and secured in place by a brass pin i'.

The instrument's earpiece D is provided with a centrally-located aperture d in the ordinary manner.

The instrument's diaphragm I is interposed between the earpiece D and the adjacent end of the case A.

The bobbin is adjustable toward and from the diaphragm to accommodate the formation of the space required between the diaphragm and the cores of the bobbin. Each core of the bobbin is provided with two brass or non-magnetic heads g g, that are fixed upon the core at opposite ends, respectively, of the wire-wound portion of the core.

g' designates insulation between the coils and heads g and is indicated by heavy black lines.

A disk K is fixed upon the two cores at the inner ends of the wire-wound portions of the cores and preferably contiguous to the outer surfaces of the inner heads g of the cores. The disk K is engaged at its surrounding edge by three screws J J J, that support the disk and the latter's load (the bobbin) and engage correspondingly-threaded holes a, formed in and longitudinally of case A, as shown in Fig. V, and by dotted lines, Fig. I. The said screws J J J are arranged equidistant apart around the edge of disk K, and each screw has two annular shoulders J' J' closely overlapping opposite sides, respectively, of the disk, and the screws between the said shoulders snugly engage the disk, that in its surrounding edge has slots K', having arc-shaped walls that partially and snugly embrace the screws. Fig. V illustrates the connection of a screw J with the disk K. By this construction it will be observed that the